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TEST REPORT

Application No.:	SHEM2108008609CR
FCC ID:	2AZSCEC-3816S
Applicant:	DeepBlue Technology (Shanghai) Co.,Ltd
Address of Applicant:	9 / F, binggu building, Weining Road, Changning District, Shanghai,China
Manufacturer:	DeepBlue Technology (Shanghai) Co.,Ltd
Address of Manufacturer:	9 / F, binggu building, Weining Road, Changning District, Shanghai,China
Factory:	DeepBlue Robotics (changzhou) Co.,Ltd
Address of Factory:	No. 8, Hongyang Road, Tianning District, Changzhou City
Equipment Under Test (EU	Т):
EUT Name:	Wireless Module
Model No.:	EC-3816S
Trade mark:	LG
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2021-08-03
Date of Test:	2021-08-21 to 2021-09-06
Date of Issue:	2021-09-11
Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards specified above.

parlan shan

Parlam Zhan Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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Revision Record						
Version Description Date Remark						
00	Original	2021-09-11	/			

Authorized for issue by:		
	Bril WU	
	Bill Wu / Project Engineer	
	Parlam zhan	
	Parlam Zhan / Reviewer	



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2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	Pass

Radio Spectrum Matter Part					
Item	Standard	Method	Requirement	Result	
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1			
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247			Pass	
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass	
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	Suppart C		Pass	
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass	
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass	
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass	



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4 General Information

4.1 Details of E.U.T.

Power Supply:	DC 3.3V
Antenna Gain:	3dBi (Provided by manufacturer)
Antenna Type:	PIFA Antenna
Bluetooth Version:	V4.2 Dual mode
Data Rate:	1Mbps
Channel Spacing:	2MHz
Modulation Type:	GFSK
Number of Channels:	40
Operation Frequency:	2402MHz to 2480MHz

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
4K Monitor	AOC	280LM00004	/
Serial port adapter plate	/		/

4.3 Power level setting using in test

Channel	BLE
0	Default
19	Default
39	Default

4.4 Measurement Uncertainty

ltem	Measurement Uncertainty
Radio Frequency	8.4 x 10 ⁻⁸
Timeout	2s
Duty cycle	0.37%
Occupied Bandwidth	3%
RF conducted power	0.6dB
RF power density	2.9dB
Conducted Spurious emissions	0.75dB
DE De dista da suver	4.2dB (Below 1GHz)
RF Radiated power	4.1dB (Above 1GHz)
	4.2dB (Below 30MHz)
Radiated Spurious emission test	4.6dB (30MHz-1GHz)
	4.8dB (1GHz-18GHz)
	5.5dB (Above 18GHz)
Temperature test	1°C
Humidity test	3%
Supply voltages	1.5%
Time	3%
	Radio Frequency Timeout Duty cycle Occupied Bandwidth RF conducted power RF power density Conducted Spurious emissions RF Radiated power RF Radiated power Temperature test Humidity test Supply voltages

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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4.5 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS (No. CNAS L4354)

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC (Designation Number: CN1172)

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• ISED (CAB Identifier: CN0072)

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development (ISED) Canada as an accredited testing laboratory.

CAB Identifier: CN0072.

• VCCI (Member No.: 1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600,C-11707, T-11499, G-10216 respectively.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



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5 Equipment List

Item	Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal. Due Date
RF	Conducted Test	1		•		
1	Spectrum Analyzer	Agilent	E4446A	MY44020154	04/16/2021	04/15/2022
2	Spectrum Analyzer	Keysight	N9020A	MY55370209	12/02/2020	12/01/2021
3	Spectrum Analyzer	Keysight	N9010A	MY56480443	02/01/2021	01/31/2022
4	Signal Generator	Agilent	N5182A	MY50142015	09/25/2020	09/24/2021
5	Radio Communication Test Station	Anritsu	MT8000A	6262012849	N/A	N/A
6	Radio Communication Analyzer	Anritsu	MT8821C	6201692222	N/A	N/A
7	Universal Radio Communication Tester	R&S	CMW500	159275	10/19/2020	10/18/2021
8	Universal Radio Communication Tester	R&S	CMW500	167239	04/16/2021	04/15/2022
9	Power Meter	Anritsu	ML2495A	1445010	04/15/2021	04/14/2022
10	Switcher	CCSRF	FY562	KUS2001M001 -3	10/19/2020	10/18/2021
11	AC Power Source	EXTECH	6605	1570106	N.C.R	N.C.R
12	DC Power Supply	Aglient	E3632A	MY50340053	N.C.R	N.C.R
13	6dB Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R	N.C.R
14	Power Divider	AISI	IOWOPE2068	PE2068	N.C.R	N.C.R
15	Filter	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
16	Conducted test cable	/	RF01-RF04	/	04/15/2021	04/14/2022
17	Software	BST	TST-PASS	N/A	N/A	N/A
18	Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	04/15/2021	04/14/2022
19	Thermometer	Anymetre	TH603	CCS007	10/16/2020	10/15/2021
RF R	adiated Test					
1	Spectrum Analyzer	R&S	FSV40	101493	10/19/2020	10/18/2021
2	Signal Generator	Agilent	E8257C	MY43321570	10/19/2020	10/18/2021
3	Loop Antenna	Schwarzbeck	HXYZ9170	9170-108	02/22/2021	02/21/2022
4	Bilog Antenna	TESEQ	CBL 6112D	35403	06/21/2021	06/20/2023
5	Bilog Antenna	SCHWARZBECK	VULB9160	9160-3342	04/13/2021	04/12/2023
6	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	267	10/26/2020	10/25/2022
7	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	00143290	02/22/2021	02/21/2023
8	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	BBHA9170171	02/22/2021	02/21/2022
9	Pre-Amplifier(30MHz~18GHz)	LNA	/	/	04/15/2021	04/14/2022
10	Amplifier(18~40GHz)	COM-POWER	PAM-840A	461332	10/23/2020	10/22/2021
11	Low Pass Filter	MICRO-TRONICS	VLFX-950	RV142900829	N.C.R	N.C.R
12	High Pass Filter	Mini-Circuits	VHF-1200	15542	N.C.R	N.C.R
13	Filter (5450MHz \sim 5770 MHz)	MICRO-TRONICS	BRC50704-01	2	N.C.R	N.C.R
14	Filter (5690 MHz \sim 5930 MHz $)$	MICRO-TRONICS	BRC50705-01	4	N.C.R	N.C.R
15	Filter (5150 MHz~5350 MHz)	MICRO-TRONICS	BRC50703-01	2	N.C.R	N.C.R
16	Filter (885 MHz~915 MHz)	MICRO-TRONICS	BRM14698	1	N.C.R	N.C.R
17	Filter (815 MHz~860 MHz)	MICRO-TRONICS	BRM14697	1	N.C.R	N.C.R
18	Filter (1745 MHz~1910 MHz)	MICRO-TRONICS	BRM14700	1	N.C.R	N.C.R
19	Filter (1922 MHz~1977 MHz)	MICRO-TRONICS	BRM50715	1	N.C.R	N.C.R
20	Filter (2550 MHz)	MICRO-TRONICS	HPM13362	5	N.C.R	N.C.R
21	Filter (1532 MHz~1845 MHz)	MICRO-TRONICS	BRM50713	1	N.C.R	N.C.R
22	Filter (2.4GHz)	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R



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23	RE test cable	/	RE01-RE04	/	04/15/2021	04/14/2022
24	Software	Faratronic	EZ_EMC-v 3A1	N/A	N/A	N/A



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

6.1.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is PIFA antenna and no consideration of replacement. The best case gain of the antenna is 3dBi.

Antenna location: Refer to Appendix (Internal Photos)



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7 Radio Spectrum Matter Test Results

7.1 Minimum 6dB Bandwidth

Test Requirement	47 CFR Part 15, Subpart C 15.247a(2)
Test Method:	ANSI C63.10 (2013) Section 11.8.1
Limit:	≥500 kHz

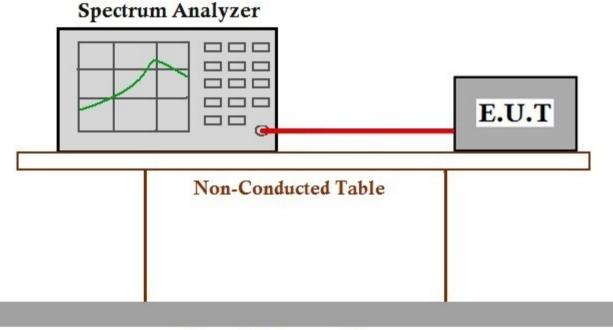
7.1.1 E.U.T. Operation

Operating Environment:

 Temperature:
 22 °C
 Humidity:
 50 % RH
 Atmospheric Pressure:
 1001 mbar

 Test mode
 h:TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation
 modulation
 modulation

7.1.2 Test Setup Diagram



Ground Reference Plane

7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix B for SHEM210800860902



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7.2 Conducted Peak Output Power

Test Requirement	47 CFR Part 15, Subpart C 15.247(b)(3)
Test Method:	ANSI C63.10 (2013) Section 11.9.1
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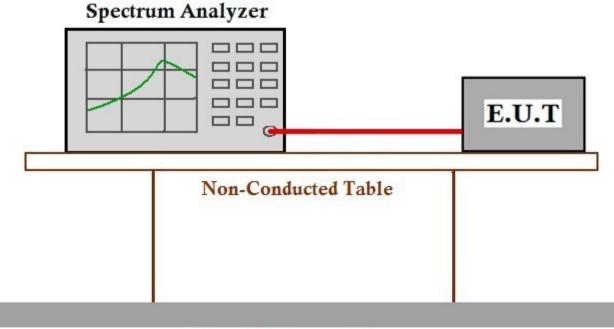
Frequency range(MHz)	Output power of the intentional radiator(watt)
	1 for ≥50 hopping channels
902-928	0.25 for 25≤ hopping channels <50
	1 for digital modulation
	1 for ≥75 non-overlapping hopping channels
2400-2483.5	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

7.2.1 E.U.T. Operation

Operating Environment:

Temperature:22 °CHumidity:50 % RHAtmospheric Pressure:1001 mbarTest modeh:TX mode_Keep the EUT in continuously transmitting mode with GFSK
modulation

7.2.2 Test Setup Diagram



Ground Reference Plane

7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix B for SHEM210800860902





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7.3 Power Spectrum Density

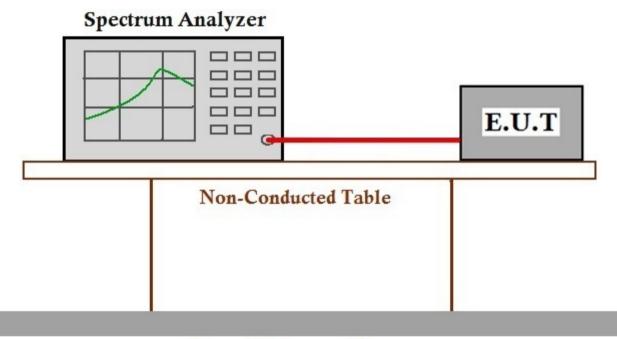
Test Requirement	47 CFR Part 15, Subpart C 15.247(e)
Test Method:	ANSI C63.10 (2013) Section 11.10.2
Limit:	${\leq}8\text{dBm}$ in any 3 kHz band during any time interval of continuous transmission

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1001 mbar Test mode h:TX mode Keep the EUT in continuously transmitting mode with GFSK modulation

7.3.2 Test Setup Diagram



Ground Reference Plane

7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix B for SHEM210800860902



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7.4 Conducted Band Edges Measurement

47 CFR Part 15, Subpart C 15.247(d) **Test Requirement** Test Method: ANSI C63.10 (2013) Section 11.13.3.2 Limit: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)



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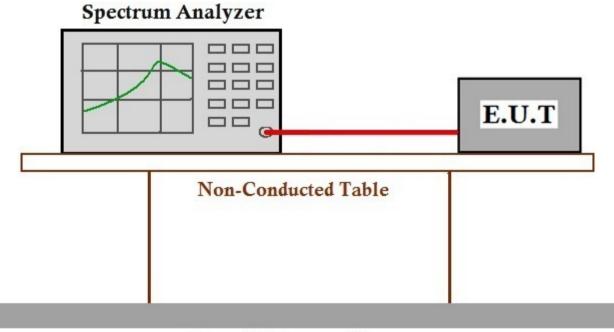
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mbar

7.4.1 E.U.T. Operation

Operating Enviro	onment:					
Temperature:	22 °C	Humidity:	50	% RH	Atmospheric Pressure: 1001	
Test mode	h:TX mode_K modulation	eep the EUT	in coi	ntinuously	r transmitting mode with GFSK	

7.4.2 Test Setup Diagram



Ground Reference Plane

7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix B for SHEM210800860902



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7.5 Conducted Spurious Emissions

Test Requirement	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 11.11
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)



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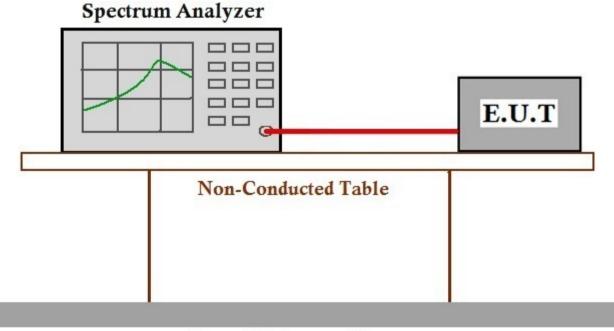
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7.5.1 E.U.T. Operation

Operating Enviro	onment:		
Temperature:	22 °C	Humidity	50

Temperature:	22 °C	Humidity:	50	% RH	Atmospheric Pressure:	1001	mbar
Test mode	h:TX mode_Ke modulation	ep the EUT i	in cor	ntinuously tra	ansmitting mode with GFS	SK	

7.5.2 Test Setup Diagram



Ground Reference Plane

7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix B for SHEM210800860902



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7.6 Radiated Emissions which fall in the restricted bands

47 CFR Part 15, Subpart C 15.205 & 15.209 **Test Requirement** ANSI C63.10 (2013) Section 6.10.5 Test Method: Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.



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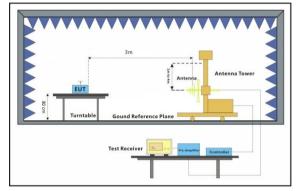
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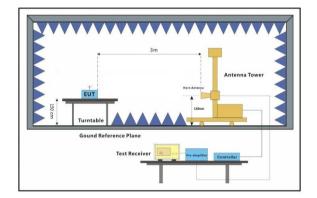
7.6.1 E.U.T. Operation

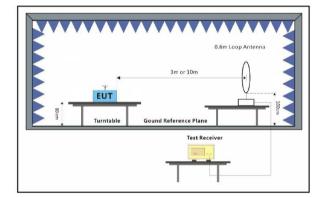
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1001 mbar h:TX mode Keep the EUT in continuously transmitting mode with GFSK Test mode modulation

7.6.2 Test Setup Diagram









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7.6.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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Mode:h; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



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	2390.000	59.58	-14.01	45.57	74.00	-28.43		peak
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Mode:h; Polarization:Vertical; Modulation:GFSK; ; Channel:Low



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0.	F	requ	enc	у	Reading	Correction		esult	Limit	Margin		Rem	nark	
-	(MHz) 2479.750		0	(dBuV) 99.36	factor(dB/m -13.71	<u> </u>	uV/m) 5.65	(dBuV/m) 74.00	(dB) 11.65		pe	ak		
			60.05	-13.71		6.34	74.00	-27.66		pe				
	2489.750 60.80		-13.68	4	7.12	74.00	-26.88		pe	ak				
		2500	00.0	0	59.10	-13.64	4	5.46	74.00	-28.54		pea	ak	

Mode:h; Polarization:Horizontal; Modulation:GFSK; ; Channel:High



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		2479	750	94.13	-13.71	80.42	74.00	6.42		peak
		2483	500	59.76	-13.71	46.05	74.00	-27.95		peak
		2498	625	61.23	-13.66	47.57	74.00	-26.43		peak
		2500	000	59.65	-13.64	46.01	74.00	-27.99		peak

Mode:h; Polarization:Vertical; Modulation:GFSK; ; Channel:High



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7.7 Radiated Spurious Emissions

Test Requirement	47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method:	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Limit:	

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.



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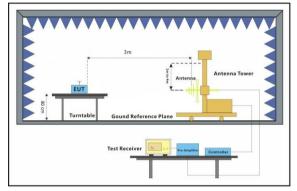
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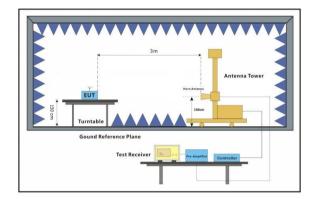
7.7.1 E.U.T. Operation

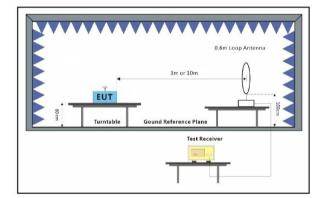
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1001 mbar h:TX mode Keep the EUT in continuously transmitting mode with GFSK Test mode modulation

7.7.2 Test Setup Diagram









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7.7.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark:

1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown



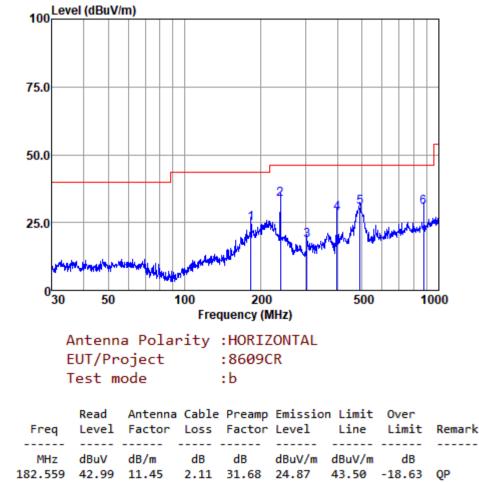
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Below 1GHz



2	238.310	51.53	10.72	2.51	31.10	33.66	46.00	-12.34	QP
3	303.544	33.38	13.40	2.84	31.08	18.54	46.00	-27.46	QP
4	397.633	40.61	15.45	3.12	30.94	28.24	46.00	-17.76	QP
5	490.745	40.09	17.52	3.51	30.47	30.65	46.00	-15.35	QP
6	875.247	35.61	23.00	4.73	32.73	30.61	46.00	-15.39	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



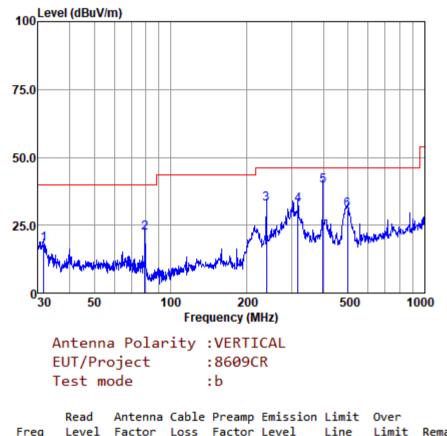
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	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	31.620	36.66	12.27	0.80	31.79	17.94	40.00	-22.06	QP
2	79.243	42.82	9.40	1.30	31.44	22.08	40.00	-17.92	QP
3	238.310	50.68	10.72	2.51	31.10	32.81	46.00	-13.19	QP
4	317.701	46.97	13.81	2.89	31.04	32.63	46.00	-13.37	QP
5	397.633	51.99	15.45	3.12	30.94	39.62	46.00	-6.38	QP
6	497.677	40.17	17.66	3.54	30.59	30.78	46.00	-15.22	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Above 1GHz

Mode:h; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low

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	1	7206.000	5	55.15		-5.8			9.26		74	.00		4.74				pe	ak		
	9	9608.000	5	51.41		-1.2	6	5	50.15		74	.00	-2	3.85				pe	ak		



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		4804.000	56.97	-8.8			8.11		74.00	-25.89			pe		
		7206.000	55.27	-5.8			9.38		74.00	-24.62			pe	ak	
	9	9608.000	51.77	-1.2	6	5	0.51		74.00	-23.49			pe	ak	

Mode:h; Polarization:Vertical; Modulation:GFSK; ; Channel:Low



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+	7	320.000	55.07		-5.7	7	4	9.30		74.00	-24.70			pe		
+	9	760.000	52.10		-1.4	5	5	0.65		74.00	-23.35			pe	ak	

Mode:h; Polarization:Horizontal; Modulation:GFSK; ; Channel:middle



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	4880.0		57.13		-8.6			8.53		74.00	-25.47			pea		
	7320.0	000	55.05		-5.7		4	9.28		74.00	-24.72			pea	ak	
	9760.0	000	51.79		-1.4	5	5	50.34		74.00	-23.66			pea	ak	

Mode:h; Polarization:Vertical; Modulation:GFSK; ; Channel:middle



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	1	7440.000	55.50	-5.6	3	4	9.87		74.00	-24.13		pe	ak
\neg	9	9920.000	51.84	-0.9	4	F	0.90		74.00	-23.10		pe	ak

Mode:h; Polarization:Horizontal; Modulation:GFSK; ; Channel:High



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		960.000	56.85	-8.3			8.53		74.00	-25.47		pe	ak	
2	- 74	440.000	55.24	-5.6	53	4	9.61		74.00	-24.39		pe	ak	
}	9	920.000	51.80	-0.9)4	5	i0.86		74.00	-23.14		pe	ak	

Mode:h; Polarization:Vertical; Modulation:GFSK; ; Channel:High



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Test Setup Photographs 8

Refer to the < Test Setup photos-FCC>.

EUT Constructional Details 9

Refer to the < Photos >.

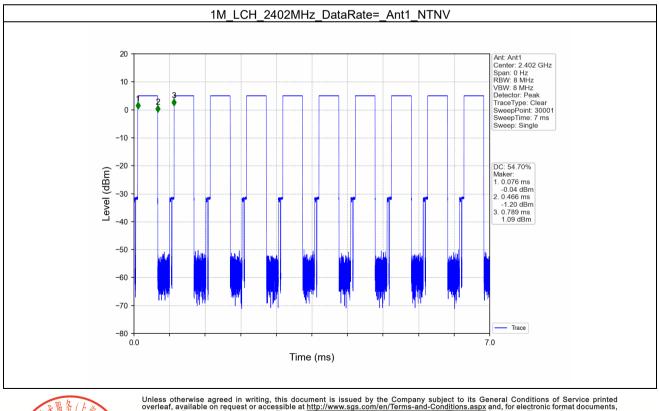
Appendix B for SHEM210800860902

- 1. Duty Cycle
- 1.1 Ant1

1.1.1 Test Result

					Ant1		
Mode	ТХ Туре	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
		2402	0.390	0.713	54.70	2.62	0.03
1M	SISO	2440	0.374	0.713	52.45	2.80	0.02
		2480	0.390	0.713	54.70	2.62	0.03

1.1.2 Test Graph





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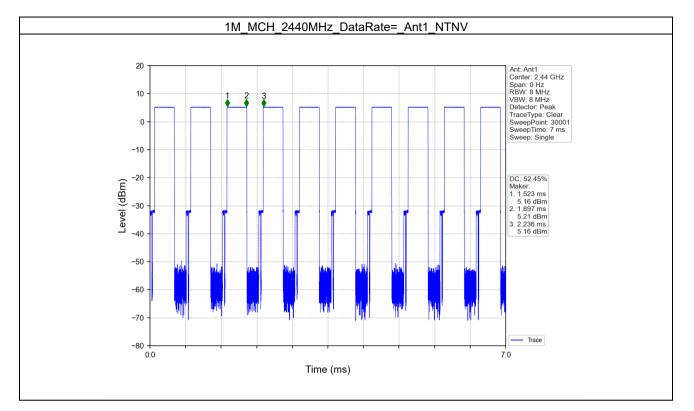
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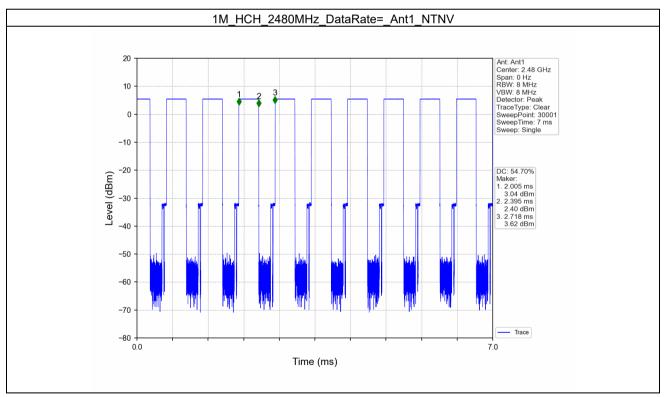
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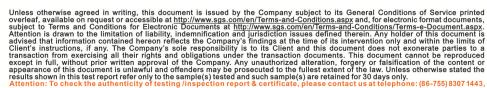


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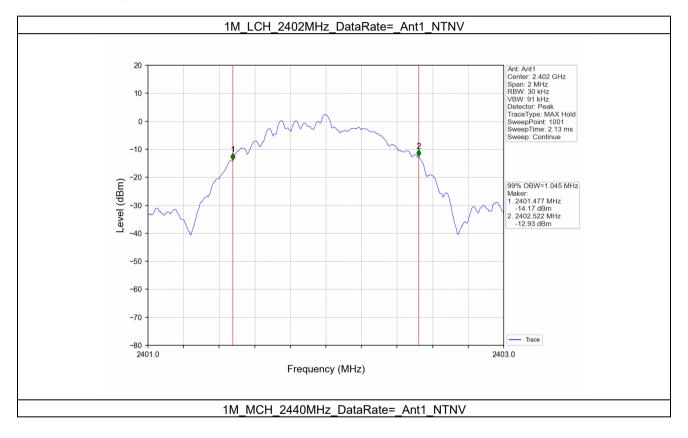
2. Bandwidth

2.1 OBW

2.1.1 Test Result

Mode	ТХ Туре	Frequency (MHz)	Ant	99% Occupied Bandwidth (MHz)	Limit (MHz)	Verdict
		2402	1	1.045	/	Pass
1M	SISO	2440	1	1.044	/	Pass
		2480	1	1.040	/	Pass

2.1.2 Test Graph





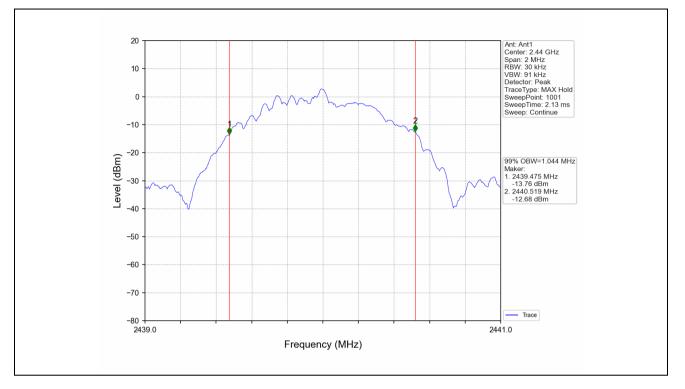
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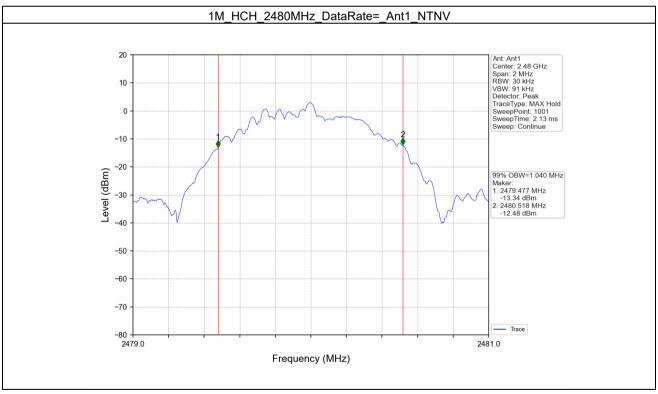
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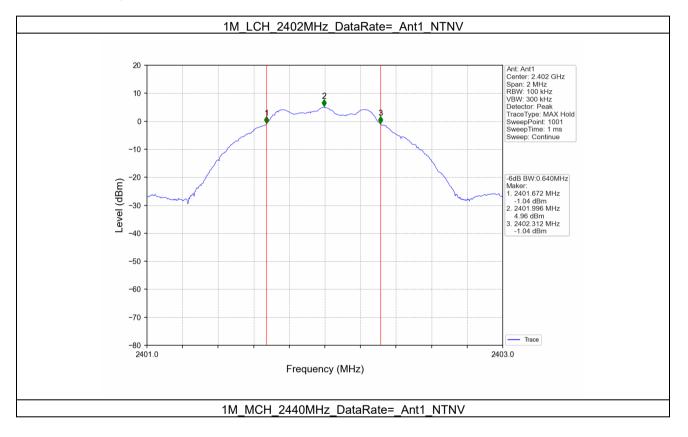
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2.2 6dB BW

2.2.1 Test Result

Mode	ТХ Туре	Frequency (MHz)	Ant	6dB Bandwidth (MHz)	Limit (MHz)	Verdict
		2402	1	0.640	>=0.5	Pass
1M	SISO	2440	1	0.644	>=0.5	Pass
		2480	1	0.653	>=0.5	Pass

2.2.2 Test Graph





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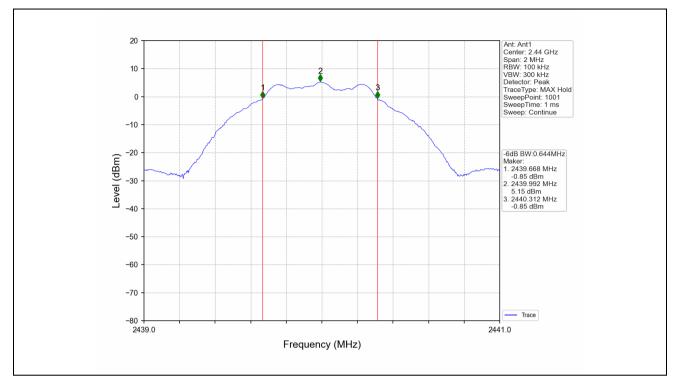
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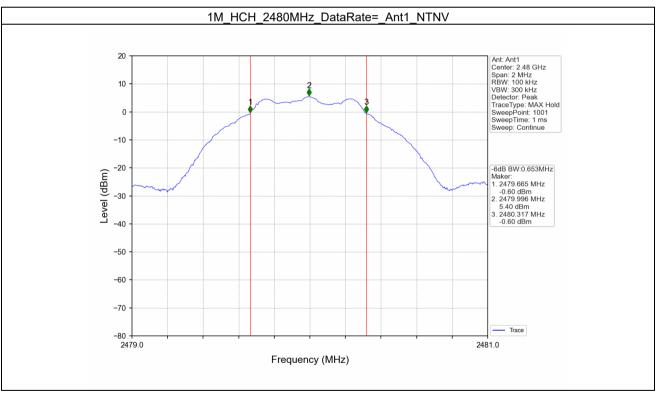
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3. Maximum Conducted Output Power

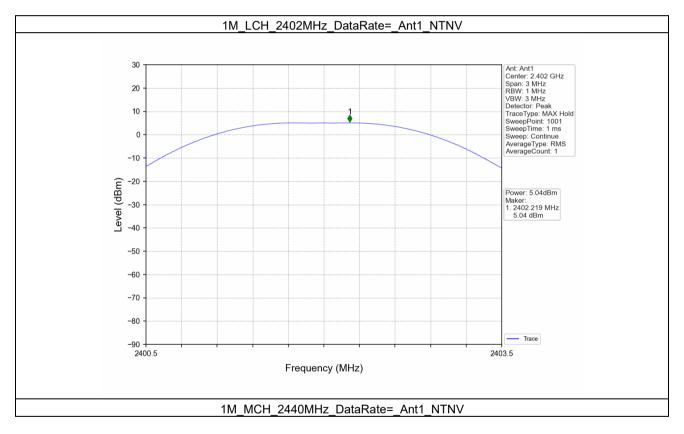
3.1 Power

3.1.1 Test Result

	lipul Power (dBm)	Measured Peak O			Mada
Verdict	Limit	Ant1	Frequency (MHz)	ТХ Туре	Mode
Pass	<=30	5.04	2402		
Pass	<=30	5.22	2440	SISO	1M
Pass	<=30	5.45	2480		
		•			

Note1: Antenna Gain: Ant1: 3.00dB

3.1.2 Test Graph





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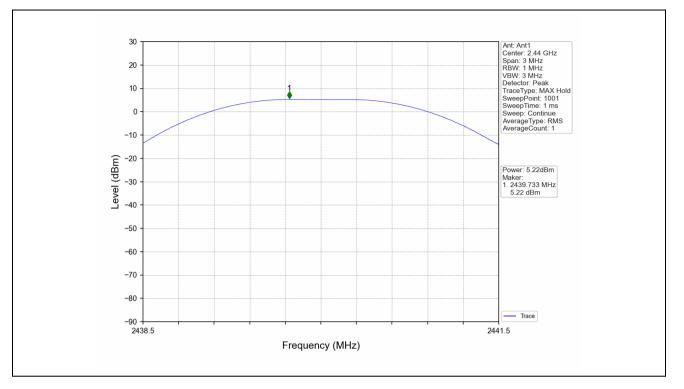
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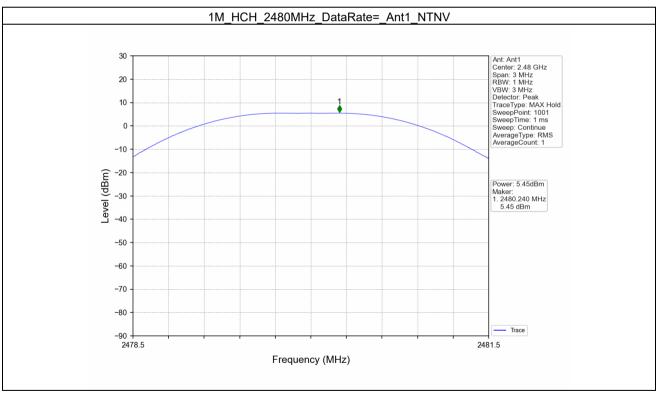


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4. Maximum Power Spectral Density

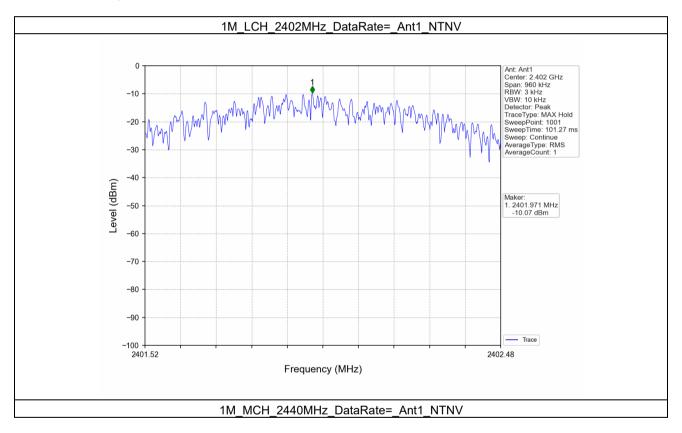
4.1 PSD

4.1.1 Test Result

Mada			Maximum PS	D (dBm/3kHz)	Vordiat
Mode	ТХ Туре	Frequency (MHz)	Ant1	Limit	Verdict
		2402	-10.07	<=8	Pass
1M	SISO	2440	-9.71	<=8	Pass
		2480	-9.26	<=8	Pass

Note1: Antenna Gain: Ant1: 0.00dBi;

4.1.2 Test Graph





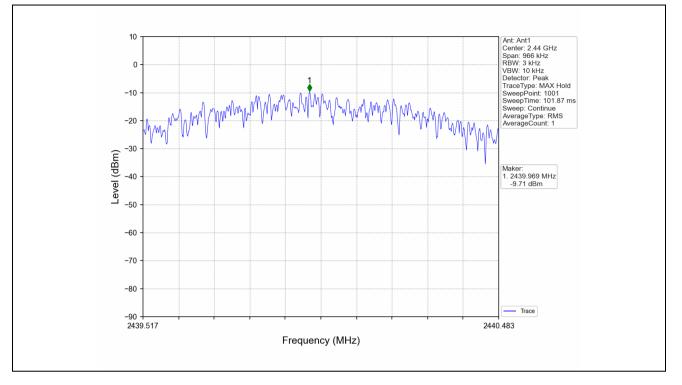
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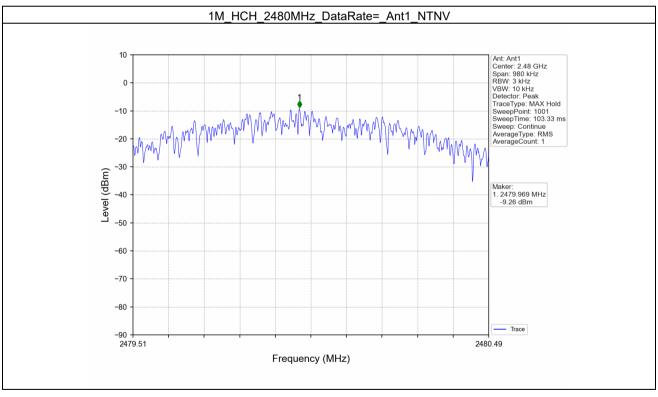
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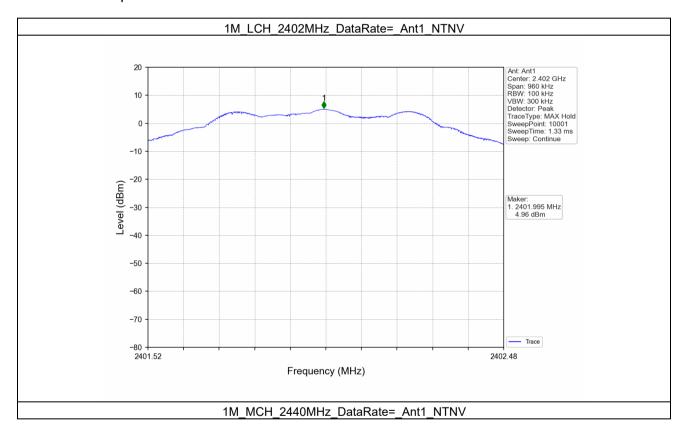
5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Ref

5.1.1 Test Result

Mode	ТХ Туре	Frequency (MHz)	Ant	Level of Reference (dBm)
		2402	1	4.96
1M	SISO	2440	1	5.15
		2480	1	5.40
Note1: Refer to establish the re		(d) and ANSI C63.10-2013, the channel co	ontains t	he maximum PSD level was used to

5.1.2 Test Graph





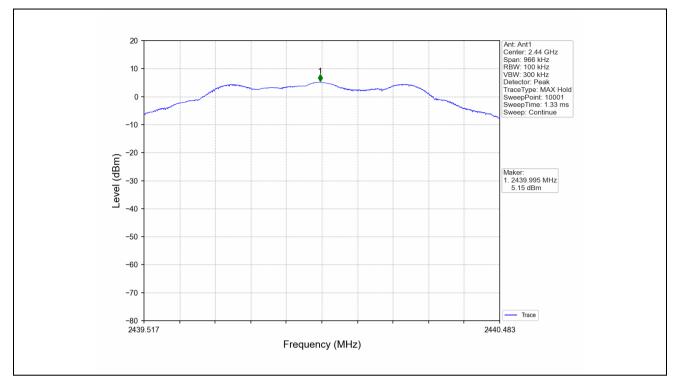
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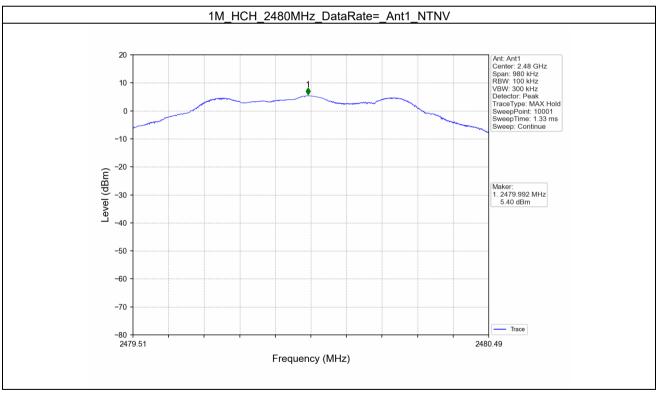
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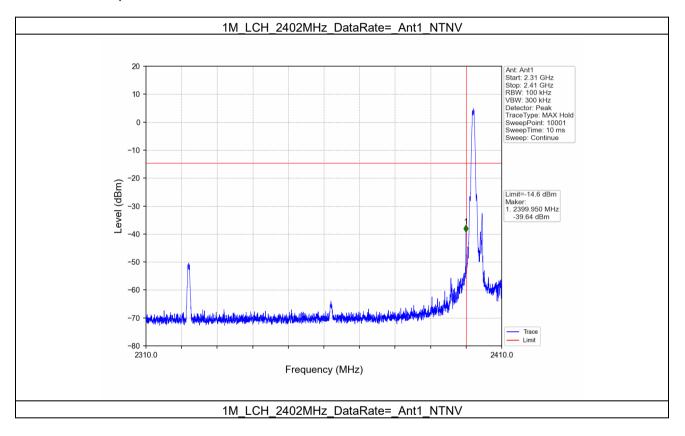
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5.2 CSE

5.2.1 Test Result

Mode	ТХ Туре	Frequency (MHz)	Ant	Level of Reference (dBm)	Limit (dBm)	Verdict
		2402	1	5.40	-14.60	Pass
1M	SISO	2440	1	5.40	-14.60	Pass
		2480	1	5.40	-14.60	Pass
	fer to FCC Pa ne reference l		0-2013	, the channel contains the maxim	um PSD level was	used to

5.2.2 Test Graph





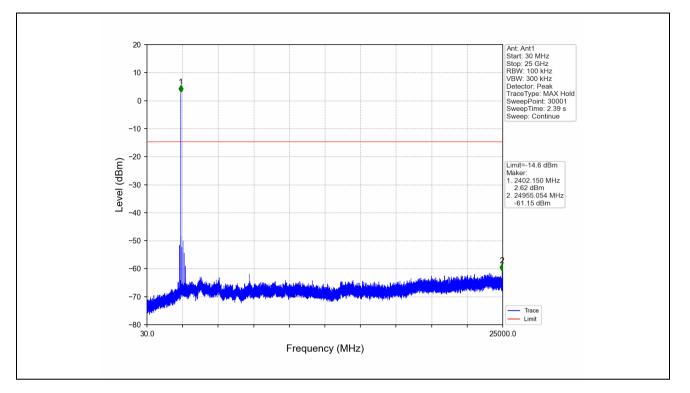
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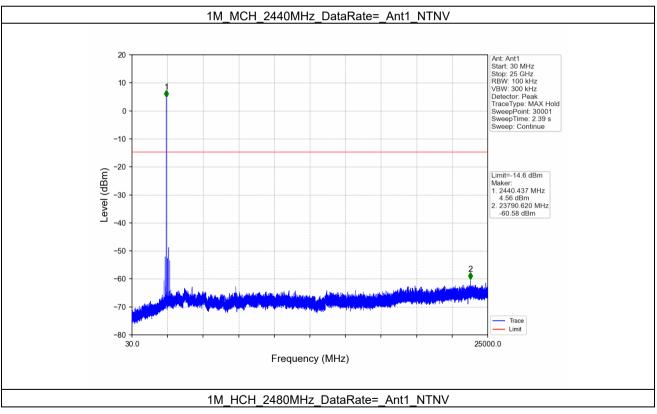
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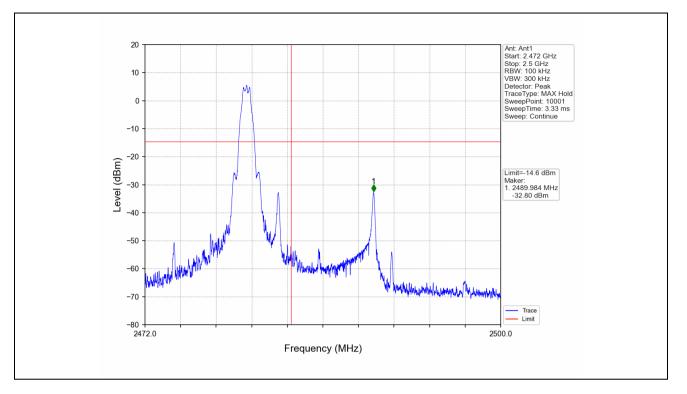
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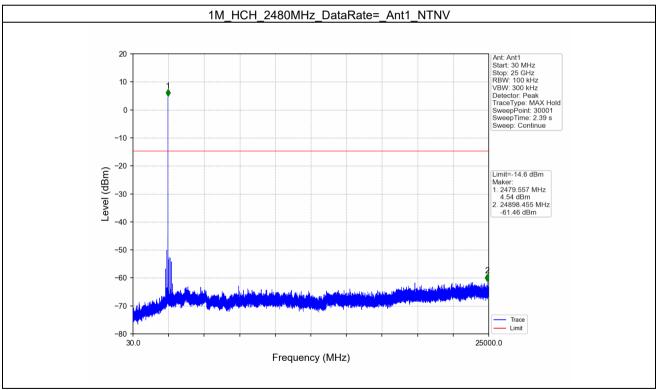
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